



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

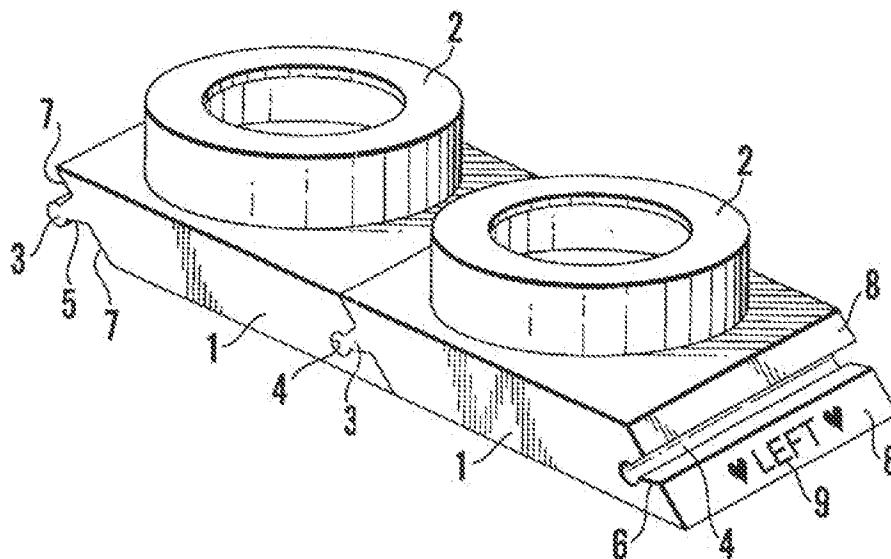
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(54) Title: IMPROVEMENTS IN OR RELATING TO CONTACT LENS CASES AND USE THEREOF

## (57) Abstract

A contact lens case (1) which is thermostable, so that the case (1), when containing a contact lens and a contact lens care solution, can be autoclaved to sterilize the lens and, later, can be opened by a wearer who can use the case (1) for storing, etc., the lens. The case (1) has a single well and is connectible, by necked tongue-in-groove connections (3, 4), directly to a substantially identical case (1) to provide a carrier for both of the wearer's contact lenses. A marking (9) at one side of the case (1) and indicating "left" or "right" becomes hidden when the cases (1) are interconnected. Each case (1) is stackable on another case (1) in such a manner that a bottom wall part of a well of the upper case (1) enters a recess (16) in an upper surface of a cap (2) covering the well of the lower case (1). A tamper-evident seal is breakable to give access to the solution.



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IMPROVEMENTS IN OR RELATING TO  
CONTACT LENS CASES AND USE THEREOF

This invention relates to a contact lens case and use thereof.

5 Contact lenses, especially hydrophilic lenses, are currently supplied in a sterile container to the ophthalmic practitioner who then dispenses them to the wearer. The preferred container used by the contact lens manufacturer is either a glass vial with a bung and aluminium crimp seal or  
10 a blister pack consisting of a lens in a plastic container sealed with aluminium foil. Both of the above are capable of allowing the lens to be sterilised, usually by "moist heat", i.e. steam under pressure, as per the norms used in the industry for sterile products.

15 The practitioner then dispenses the lens to the wearer and discards the container. Most wearers who do not use "daily disposable" lenses must then disinfect and store their lenses after wear in a lens case (normally a side-by-side case with left and right wells) which is usually made of a  
20 plastic material. Not all wearers change their lens cases when they acquire a new pair of lenses. The lens cases, if not properly cleaned, can be a source for bacterial/microbiological organisms growth which in turn could contaminate the lenses and infect the wearer's eyes. The  
25 trend in the industry has moved to prescribing lenses for frequent replacement over a 1-month or 3-month period, but it is still important for the wearer to change his lens case and this is not always complied with.

According to a first aspect of the present invention,  
30 there is provided a contact lens case in which a wearer is to store a lens, characterized in that said case is thermostable.

Owing to this aspect of the present invention, the contact lens case, when containing a contact lens and a contact lens care solution, can be autoclaved to sterilize the lens, so that there is no need for the lens-containing package to be opened until it is received by the intended wearer and then the wearer can use the case for storing, etc. the lens.

5 This has the advantages of being more environmentally friendly, since no vials or containers need be thrown away by the practitioner, and, although the wearer is encouraged to throw away the old lens cases at regular intervals, there is less risk of infection of the wearer's eyes.

10 The lens case preferably has a single well and may be connectible directly or indirectly to an identical, or almost identical, lens case to provide a combined carrying/storage/disinfecting case or carrier for carrying both of the wearer's contact lenses.

By "thermostable" herein is meant that the case can be autoclaved under any one of the following regimes without losing its dimensional stability:

- (i) at 134°C for 3 min.
- 15 (ii) at 126°C for 10 min.
- (iii) at 121°C for 15 min.
- (iv) at 115°C for 30 min.

20 According to a second aspect of the present invention, there is provided a method of using a contact lens case, comprising placing a contact lens and a contact lens care solution in said case, and autoclaving the case containing the lens and the solution to sterilize the lens, characterized by presenting the contact lens case to an intended wearer.

25 Owing to this aspect of the invention, an agent or distributor can autoclave a package consisting of the case, the lens and the solution, there is no need for the package to be opened until it is received by the wearer (or until at least shortly before it is presented to the wearer), and then the wearer can use the case for storing, etc. the lens.

30 According to a third aspect of the present invention, there is provided a contact lens case having a well, characterized in that said case has also connecting means whereby said case can be directly connected to another contact lens case.

35 According to a fourth aspect of the present invention, there is provided in combination, first and second contact lens cases having respective wells and substantially identical to each other, characterized in that the cases have

respective connecting means whereby the cases have been connected to each other.

Owing to these aspects of the present invention, one case can be directly connected to another case so as to provide a carrier for both of a wearer's contact lenses.

The cases are advantageously identical, or almost identical, to each other, whereby manufacture of the cases is simplified and there is no need for the agent, distributor or optician to have to concern himself with ensuring that a case has been correctly selected.

The connecting means is advantageously located laterally of the well, so that the cases are directly connectible side-by-side to provide a pair of side-by-side wells.

The connecting means preferably incorporates some means obstructing (in particular preventing) disconnection of the cases from each other once connected together.

According to a fifth aspect of the present invention, there is provided a contact lens case having a well, characterized in that said case has connecting means whereby said case can be connected to another contact lens case and has also a marking at one side thereof which indicates "left" or "right" and which becomes hidden when the first-mentioned case is connected to said other contact lens case.

Owing to this aspect of the present invention, it is possible to arrange that, when the two cases are connected together to form a carrier for a pair of contact lenses, the well for the left lens or for the right lens is clearly indicated.

There could be, on each case, only one marking indicating "left" or "right", or two markings at respective opposite sides of the case indicating "left" and "right", respectively.

According to a sixth aspect of the present invention, there is provided in combination, first and second contact lens cases substantially identical to each other, characterized in that said cases are stackable one upon another in such a manner that a bottom part of a well of a well of the upper case enters a recess in the top of the lower case.

Owing to this aspect of the invention, the contact lens cases occupy less storage space and less transport space.

The recess may be in an upper surface of a cap covering the well of the identical case.

5 According to a seventh aspect of the present invention, there is provided a package comprising a contact lens case having a well, a contact lens in said well and a contact lens care solution in said well, characterized in that said package includes a tamper-evident seal which is breakable to give access to said solution.

10 Owing to this aspect of the invention, the tamper-evident seal provides a safeguard against tampering with the lens or the solution.

15 In order that the invention may be clearly understood and readily carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:-

Figure 1 is a diagrammatic top perspective view of two contact lens cases connected together to form a carrier for a pair of contact lenses,

20 Figure 2 is a top plan of one contact lens case,

Figure 3 is a side elevation of that case,

Figure 4 is an underneath perspective view of that case, and

25 Figure 5 is a side elevation of a carrier formed from two cases each according to Figures 2 to 4.

Figure 1 illustrates a principle of use of two single-well, contact lens cases 1 identical to each other. Each case includes a case body 2' defining a well (not shown) sealingly covered by a hinged snap-cap, or preferably a separate screw-cap 2. The quality of the seal between the closure cap 2 and the body 2' is sufficiently high that a good fluid-tight seal is retained during autoclaving. At respective opposite sides of each case are respective halves 3 and 4 of tongue-in-groove connections 3,4 whereof the tongues 3 and grooves 4 are necked at 5 and 6 and are substantially exact fits, with substantial surfaces 7 and 8, respectively, extending above and below the tongues 3 and grooves 4, to give strength and stability to the connections 3,4. The surfaces 7 and 8 are oblique to the vertical, so that markings 9 indicating "LEFT"

in the example and formed on the surfaces 8 may be easier to read. The tongue 3 of one case 1 is shown slid along the groove 4 of the other case 1, to connect the two cases together side-by-side.

5 Referring to Figures 2 to 5 which show each case 1 in more detail, a wall 10 of the well projects downwards into an underneath recess 11 of the case 1. The recess is bounded by a flat base surface 12 of the case to give good stability on a supporting surface, such as a table. The grooved side of 10 the case is of a fish-tail shape in plan view to match the shape of the tongued side of the case so that the connection 3,4 is flush at its ends.

15 The tongue 3 is formed at its thickened edge with a notch 13 to be engaged by a pip 14 in the groove 4 of another case 1, to provide positive latching of the tongue in the groove longitudinally, as illustrated in Figure 6. The inside surfaces of the cap 2 and the well of each case 1 include 20 protrusions in the form of pimples or rods to discourage adhesion of the lens to either surface. The cases are designed so as to be readily stackable in an interengaging manner, with the bottom part of the wall 10 of an upper case 1 entering the recess 16 in a lower case 1. The bottom part of the wall 10 may be so shaped as to fit into the recess 16.

25 The cases 1 are moulded from thermostable plastics, for example polypropylene (PP). Their use is as follows. The agent/distributor places the hydrated lens in a case 1 containing saline, with "moist heat" autoclaves the package so formed, affixes a label to a wall 15 of a top recess 16 in the top surface of the cap 2 and sells to the optician as 30 such. The label could include a breakable strip extending over the rim of the cap 2 and adhered to the body of the case 1, to provide a tamper-evident device. An alternative, and more desirable, tamper-evident device would be a breakable plastic strip between the cap 2 and the case body 2'.

35 When the optician prescribes the contact lenses to a wearer, the optician will select the appropriate left/right eye prescriptions from stock. Each lens will be in its single-well case and these two cases can then be interlocked to form a side-by-side case which can be used for the

storage, disinfecting, soaking and carrying of the contact lenses.

**CLAIMS**

1. A contact lens case in which a wearer is to store a lens, characterized in that said case (1) is thermostable.
- 5 2. A contact lens case according to claim 1, wherein said case (1) is of moulded thermostable plastics.
3. A contact lens case according to claim 2, wherein said case (1) is of polypropylene.
- 10 4. A contact lens case according to any preceding claim, wherein said case (1) has a single well for receiving a single contact lens.
5. A contact lens case according to any preceding claim, wherein said case (1) has connecting means (3,4) by way of which said case (1) is connectible to a substantially identical case (1) to provide a combined case (1,1) for carrying both of the wearer's contact lenses.
- 15 6. A contact lens case according to claim 5, wherein said connecting means (3,4) comprises one half (3/4) of a tongue-in-groove connection (3,4).
7. A contact lens case according to claim 6, wherein said one half (3/4) of the tongue-in-groove connection (3,4) is necked (5/6) to fit necking (6/5) of the other half (4/3) of the tongue-in-groove connection (3,4).
- 20 8. A contact lens case according to any one of claims 5 to 7, as appended to claim 4, wherein said connecting means (3,4) is located laterally of said well.
- 25 9. A contact lens case according to claim 8, wherein said connecting means (3,4) incorporates locating means (13,14) obstructing disconnection of said contact lens case (1) from said substantially identical case (1) once connected together.
- 30 10. A contact lens case according to claim 9 as appended to claim 6, wherein said locating means (13,14) comprises a detent (14) to engage in an indentation (13) to provide positive latching of the tongue (3) in the groove (4) longitudinally.
- 35 11. A contact lens case according to claim 6, 7, or 10, or claim 8 or 9 as appended to claim 6, wherein said one half (3/4) is a groove (4) and said contact lens case (1) is of a fish-tail shape in plan view in the region of said groove

(4).

12. A contact lens case according to any one of claims 5 to 11, wherein said contact lens case (1) has, adjacent said connecting means (3,4), a substantial surface (8) for abutment face-to-face against a surface (7) of said substantially identical case (1) to give stability to said connecting means (3,4).

5 13. A contact lens case according to claim 12, wherein said substantial surface (8) faces obliquely upwardly.

10 14. A contact lens case according to claim 12 or 13, wherein said substantial surface (8) carries a marking (9) indicating "left" or "right".

15 15. A contact lens case according to any preceding claim, wherein said contact lens case (1) has a substantially flat base surface (12).

16. A contact lens case according to claim 15 as appended to claim 4, wherein a wall (10) of said well projects downwards into an underneath recess (11) of said contact lens case (1), which recess (11) is bounded by said base surface (12).

20 17. A contact lens case according to any preceding claim, wherein said contact lens case (1) is readily stackable in an interengaging manner upon a substantially identical case (1).

18. A contact lens case according to claim 17 as appended to 25 claim 16, wherein a bottom part of said wall (10) is insertable into a top recess (16) in the top of a substantially identical case (1).

19. A contact lens case according to claim 18, wherein said top recess (16) is formed in an upper surface of a closure cap (2) of said contact lens case (1).

30 20. A method of using a contact lens case, comprising placing a contact lens and a contact lens care solution in said case (1), and autoclaving the case (1) containing the lens and the solution to sterilize the lens, characterized by presenting the contact lens case (1) to an intended wearer.

35 21. A method according to claim 20, and further comprising, no earlier than shortly before said presenting, opening said case (1).

22. A method according to claim 21, and further comprising, after said presenting and said opening, said wearer using the

case (1) for storing the lens.

23. A contact lens case having a well, characterized in that said case (1) has also connecting means (3,4) whereby said case (1) can be directly connected to another contact lens case (1).

24. In combination, first and second contact lens cases (1) having respective wells and substantially identical to each other, characterized in that the cases (1) have respective connecting means (3,4) whereby the cases (1) have been connected to each other.

25. A combination according to claim 24, wherein said connecting means (3,4) is located laterally of the individual wells, so that the cases (1) are directly connected side-by-side to provide a pair of side-by-side wells.

26. A combination according to claim 24 or 25, wherein said connecting means (3,4) incorporates means (13,14) obstructing disconnection of the cases (1) from each other.

27. A contact lens case having a well, characterized in that said contact lens case (1) has connecting means (3,4) whereby said contact lens case (1) can be connected to another case (1) for another contact lens and has also a marking (9) at one side thereof which indicates "left" or "right" and which becomes hidden when said contact lens case (1) is connected to said other case (1).

28. A contact lens case according to claim 27, wherein there is, on said contact lens case (1), only one said marking (9).

29. A contact lens case according to claim 27, wherein there are, on said contact lens case (1), two markings (9) at respective opposite sides of said contact lens case (1) indicating "left" and "right", respectively.

30. In combination, first and second contact lens cases (1) substantially identical to each other, characterized in that said cases (1) are stackable one upon another in such a manner that a bottom part of a wall (10) of a well of the upper case (1) enters a recess (16) in the top of the lower case (1).

31. A combination according to claim 30, wherein said recess (16) is in an upper surface of a cap (2) covering a well of the lower case (1).

32. A package comprising a contact lens case having a well, a contact lens in said well and a contact lens care solution in said well, characterized in that said package includes a tamper-evident seal which is breakable to give access to said solution.

1/2

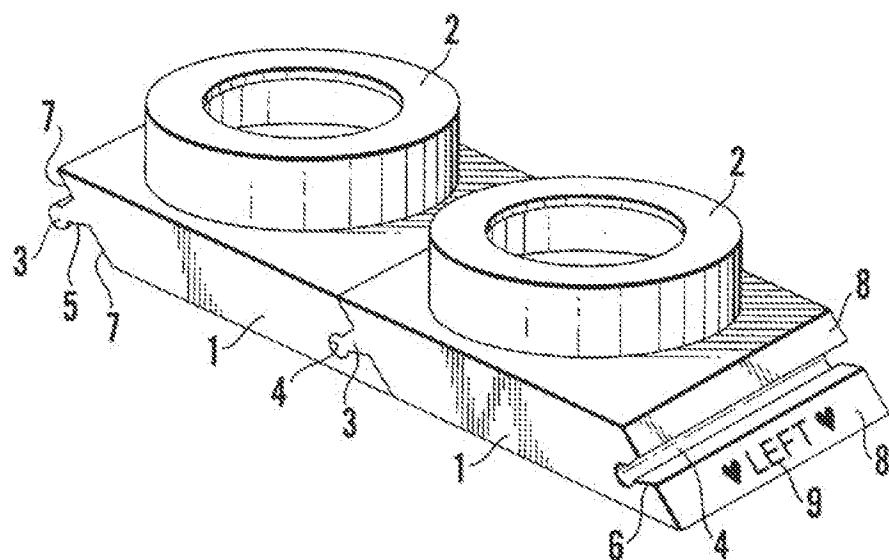


Fig. 1

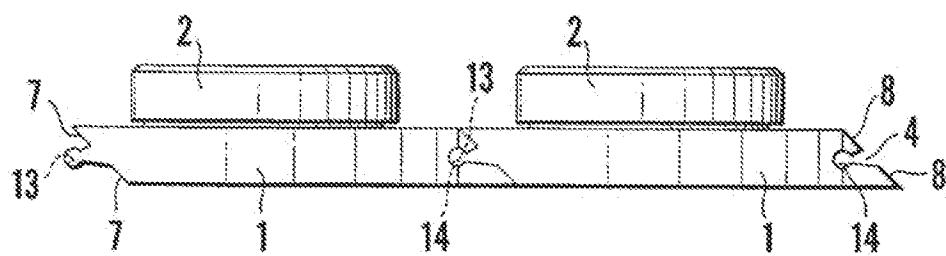


Fig. 5

2/2

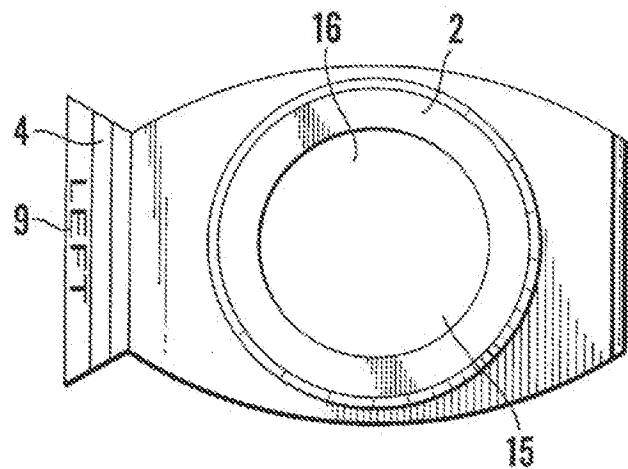


Fig. 2

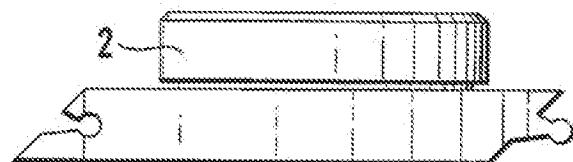


Fig. 3

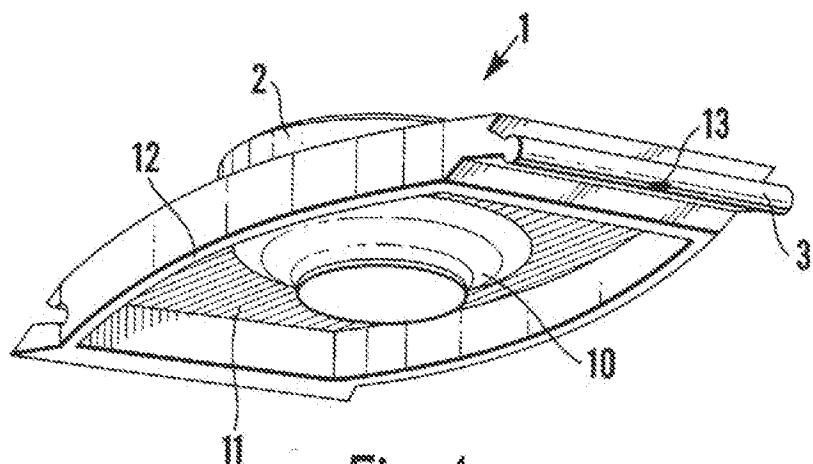


Fig.4

## INTERNATIONAL SEARCH REPORT

Int. Search Application No.

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A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 A45C11/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 224 593 A (BENNET) 6 July 1993  see the whole document	1-5, 8-10, 12, 15, 20-26, 32
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X	WO 94 24019 A (ALLERGAN) 27 October 1994  see the whole document	1-4, 15, 20, 21
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Date of the actual completion of the international search

Date of mailing of the International Search Report

16 February 1998

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